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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/673,656	09/29/2003	Takehiro Nakamura	15689.49.2	2350

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EXAMINER	
GREY, CHRISTOPHER P	
ART UNIT	PAPER NUMBER
2474	

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10/26/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/673,656	NAKAMURA ET AL.	
	Examiner	Art Unit	
	CHRISTOPHER P. GREY	2474	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 June 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *19-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *19-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. In view of applicant's amendment filed on 6/16/10, the status of the application is still pending with respect to claims 19-26.

Response to Arguments

2. Applicant's arguments with respect to claims 10-26 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

3. Claims 18-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 21 and 18: The claim limitation "means for transmitting/ means for receiving/means for carrying out coherent detection" uses the phrase "means for" or "step for", but it is modified by some structure, material, or acts recited in the claim. It is unclear whether the recited structure, material, or acts are sufficient for performing the claimed function which would preclude application of 35 U.S.C. 112, sixth paragraph, because the claim is modified by sufficient structure.

If applicant wishes to have the claim limitation treated under 35 U.S.C. 112, sixth paragraph, applicant is required to amend the claim so that the phrase "means for" or

"step for" is clearly **not** modified by sufficient structure, material, or acts for performing the claimed function.

If applicant does **not** wish to have the claim limitation treated under 35 U.S.C. 112, sixth paragraph, applicant is required to amend the claim so that it will clearly not be a means (or step) plus function limitation (e.g., deleting the phrase "means for" or "step for").

Assuming Applicant intended to invoke 35 U.S.C. 112, sixth paragraph, it is unclear to one of ordinary skill in the art whether the recited structure, material, or acts in the claim are sufficient for performing the claimed function. Since the claims are directed to computer-implemented means plus function subject matter, merely referencing to a general purpose computer with appropriate programming without providing any detailed explanation of the appropriate programming, the written description of the specification discloses no corresponding algorithm or simply reciting software without providing some detail about the means to accomplish the function, would not be an adequate disclosure of the corresponding structure to satisfy the requirement of 35 U.S.C. 112, second paragraph, even when one of ordinary skill in the art is capable of writing the software to convert a general purpose computer to a special purpose computer to perform the claimed function.

Claim 19, 20 and 22 contains a similar issue as discussed for claim 21 above, thus, the dependent claims are rejected for the same reasons as set forth above for claim X.

Claim element "transmitting", "receiving" and "carrying out coherent detection" is a means (or step) plus function limitation that invokes 35 U.S.C. 112, sixth paragraph. However, the written description fails to disclose the corresponding structure, material, or acts for the claimed function.

Applicant is required to:

(a) Amend the claim so that the claim limitation will no longer be a means (or step) plus function limitation under 35 U.S.C. 112, sixth paragraph; or

(b) Amend the written description of the specification such that it expressly recites what structure, material, or acts perform the claimed function without introducing any new matter (35 U.S.C. 132(a)).

If applicant is of the opinion that the written description of the specification already implicitly or inherently discloses the corresponding structure, material, or acts so that one of ordinary skill in the art would recognize what structure, material, or acts perform the claimed function, applicant is required to clarify the record by either:

(a) Amending the written description of the specification such that it expressly recites the corresponding structure, material, or acts for performing the claimed function and clearly links or associates the structure, material, or acts to the claimed function, without introducing any new matter (35 U.S.C. 132(a)); or

(b) Stating on the record what the corresponding structure, material, or acts, which are implicitly or inherently set forth in the written description of the specification,

perform the claimed function. For more information, see 37 CFR 1.75(d) and MPEP §§ 608.01(o) and 2181.

Claims 19, 20 and 22 contains a similar issue as discussed for claim 21 above, thus, the dependent claims are rejected for the same reasons as set forth above for claim X.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 18-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barroso (US 6,389,003), in view of Matsumoto et al. (US 5912931), hereinafter referred to as Mat in view of Baker et al. (US 5067139), hereinafter referred to as Baker.

Regarding claim 18, Barroso discloses means for transmitting **(Column 1 lines 51-56)**, on a transmitting side **(Column 1 lines 51-56)**, a block consisting of a plurality of known pilot symbols at every slot, a predetermined number of said slots forming a frame **(Table 1 and Column 2 lines 24-63)**;

means for receiving, on a receiving side **(Col 1 lines 51-56 shows a receiver)**, said blocks each consisting of said pilot symbols **(Table 1 and Column 2 lines 24-63)**; and

wherein said known pilot symbols of each slot consists of a known pilot symbol portion and a sync word portion for frame alignment **(Table 1 and Column 2 lines 24-63, notice SW's used for frame alignment and notice pilot symbol pattern)**, the known pilot symbol portion and the sync word portion in each slot being aligned consecutively **(Table 1 shows consecutive alignment)**.

Barroso does not specifically disclose means for carrying out coherent detection using the received blocks and wherein said means for carrying out coherent detection carries out the coherent detection using said known pilot symbol portion.

Mat discloses means for carrying out coherent detection **(Col 7 lines 3-6 shows coherent detectors)** by using the received blocks **(Col 7 lines 3-11, coherent detectors using known symbols, such as the unique word and pilot symbols)**

wherein said means for carrying out coherent detection **(Col 7 lines 3-6 shows coherent detectors)** carries out the coherent detection using said known pilot symbol portion **(Col 7 lines 3-11, coherent detectors using known symbols, such as the unique word and pilot symbols)**.

It would have been obvious to one of the ordinary skill in the art at the time of the invention was disclosed to modify the process of receiving of Barroso, as taught by Mat, since stated in Col 7 lines 8-19 of Mat, that such a modification will provide a signal detection using coherent detection and employing a fading estimation scheme that takes into account the generation process of the fading frequency selectivity and exploit

the benefit of the offset pilot location thus overcoming the disadvantages of prior art as it pertains to frequency selective fading.

Although Mat discloses carrying out coherent detection using sync symbols **(Col 7 lines 3-11, coherent detectors using known symbols, such as the unique word and pilot symbols),** the combined teachings of Barroso and Mat do not explicitly suggest employing, after establishing the frame alignment using said sync word portion, said sync word portion for the coherent detection.

Baker discloses employing, after establishing the frame alignment **(fig 1, where the mixing of the received signal with the NCO is equivalent to frame synchronization, and this mixing is the first process done in the coherent detection, thus the completion of coherent detection is achieved after this process of synchronization)** using said sync word portion **(Col 2 lines 30-35, where the sync word is used for frame synchronization)**, said sync word portion **(Col 2 lines 30-35, where the sync word is used for frame synchronization)** for the coherent detection **(see fig 1 for coherent detection)**.

It would have been obvious to one of the ordinary skill in the art at the time of the invention was disclosed to modify the coherent detector disclosed by the combined teachings of Barroso and Mat, as taught by Baker, since stated in Col 1 lines 30-35 of Baker, that such a modification will fulfill the need for a coherent detector that can determine the initial constellation point rapidly and track the rotating constellation.

Regarding claim 19, Barroso discloses wherein said known pilot symbols of each slot comprise multiple known pilot symbol portions and multiple sync word portion aligned consecutively and wherein said pilot symbol portion and said sync word portion are transmitted alternately in each slot **(Table 1 shows multiple alternating pilots and syncs in each slot)**.

Regarding claim 20, Barroso discloses a radio communication system that carries out radio communications between a base station and a mobile station on a mobile communication network using the digital radio communication system as claimed in claim 18 **(Column 1 lines 65-67 shows base station and air interface)**.

Regarding claim 21, Barroso discloses means for receiving a block **(Column 1 lines 51-56)** consisting of a plurality of known pilot symbols, which has been transmitted at every slot **(Table 1 and Column 2 lines 24-63)**, a predetermined number of said slots forming a frame **(Table 1 and Column 2 lines 24-63)**; and

wherein said block consisting of said pilot symbols consists of a known pilot symbol portion and a sync word portion for frame alignment **(Table 1 and Column 2 lines 24-63, notice SW's used for frame alignment and notice pilot symbol pattern)**.

Barroso does not specifically disclose means for carrying out coherent detection using the received blocks and wherein said means for carrying out coherent detection carries out the coherent detection using said known pilot symbol portion.

Mat discloses means for carrying out coherent detection **(Col 7 lines 3-6 shows coherent detectors)** by using the received blocks **(Col 7 lines 3-11, coherent detectors using known symbols, such as the unique word and pilot symbols)**

wherein said means for carrying out coherent detection **(Col 7 lines 3-6 shows coherent detectors)** carries out the coherent detection using said known pilot symbol portion **(Col 7 lines 3-11, coherent detectors using known symbols, such as the unique word and pilot symbols),** the known pilot symbol portion and the sync word portion in each slot being aligned consecutively **(Table 1 shows consecutive alignment)**.

It would have been obvious to one of the ordinary skill in the art at the time of the invention was disclosed to modify the process of receiving of Barroso, as taught by Mat, since stated in Col 7 lines 8-19 of Mat, that such a modification will provide a signal detection using coherent detection and employing a fading estimation scheme that takes into account the generation process of the fading frequency selectivity and exploit the benefit of the offset pilot location thus overcoming the disadvantages of prior art as it pertains to frequency selective fading.

Although Mat discloses carrying out coherent detection using sync symbols **(Col 7 lines 3-11, coherent detectors using known symbols, such as the unique word and pilot symbols),** the combined teachings of Barroso and Mat do not explicitly suggest employs, after establishing the frame alignment using said sync word portion, said sync word portion for the coherent.

Baker discloses employs, after establishing the frame alignment **(fig 1, where the mixing of the received signal with the NCO is equivalent to frame synchronization, and this mixing is the first process done in the coherent detection, thus the completion of coherent detection is achieved after this process of synchronization)** using said sync word portion **(Col 2 lines 30-35, where the sync word is used for frame synchronization)**, said sync word portion **(Col 2 lines 30-35, where the sync word is used for frame synchronization)** for the coherent detection **(see fig 1 for coherent detection)**.

It would have been obvious to one of the ordinary skill in the art at the time of the invention was disclosed to modify the coherent detector disclosed by the combined teachings of Barroso and Mat, as taught by Baker, since stated in Col 1 lines 30-35 of Baker, that such a modification will fulfill the need for a coherent detector that can determine the initial constellation point rapidly and track the rotating constellation.

Regarding claim 22, Barroso discloses wherein said known pilot symbols of each slot comprise multiple known pilot symbol portions and multiple sync word portion aligned consecutively and wherein said pilot symbol portion and said sync word portion are transmitted alternately in each slot **(Table 1 shows multiple alternating pilots and syncs)**.

Regarding claim 23, Barroso discloses transmitting **(Column 1 lines 51-56)**, on a transmitting side **(Column 1 lines 51-56)**, a block **(fig 2 shows a block of data)** consisting of a plurality of known pilot symbols **(fig 2, 203 and Col 3 lines 54-56, "predetermined pilot symbols (203) inserted at selected intervals")** at every slot

(fig 2 shows a typical timeslot, where data, pilot and sync symbols are included), a predetermined number of said slots forming a frame **(fig 2, and Col 3 lines 48-50, which teaches TDM, which is known in the art to have a predetermined number of slots forming a frame)**;

receiving, on a receiving side **(Column 1 lines 51-56)**, said blocks each consisting of said pilot symbols **Table 1 and Column 2 lines 24-63, notice pilot symbol pattern)** and

wherein said block consisting of pilot symbols consists of a known pilot symbol portion and a sync word portion for frame alignment **(Table 1 and Column 2 lines 24-63, notice SW's used for frame alignment and notice pilot symbol pattern)**, the known pilot symbol portion and the sync word portion in each slot being aligned consecutively **(Table 1 shows consecutive alignment)**

Barroso does not specifically disclose means for carrying out coherent detection using the received blocks and wherein said means for carrying out coherent detection carries out the coherent detection using said known pilot symbol portion.

Mat discloses means for carrying out coherent detection **(Col 7 lines 3-6 shows coherent detectors)** by using the received blocks **(Col 7 lines 3-11, coherent detectors using known symbols, such as the unique word and pilot symbols)**

wherein said means for carrying out coherent detection **(Col 7 lines 3-6 shows coherent detectors)** carries out the coherent detection using said known pilot symbol

portion **(Col 7 lines 3-11, coherent detectors using known symbols, such as the unique word and pilot symbols)**.

It would have been obvious to one of the ordinary skill in the art at the time of the invention was disclosed to modify the process of receiving of Barroso, as taught by Mat, since stated in Col 7 lines 8-19 of Mat, that such a modification will provide a signal detection using coherent detection and employing a fading estimation scheme that takes into account the generation process of the fading frequency selectivity and exploit the benefit of the offset pilot location thus overcoming the disadvantages of prior art as it pertains to frequency selective fading.

Although Mat discloses carrying out coherent detection using sync symbols **(Col 7 lines 3-11, coherent detectors using known symbols, such as the unique word and pilot symbols),** the combined teachings of Jasper and Mat do not explicitly suggest employs, after establishing the frame alignment using said sync word portion, said sync word portion for the coherent.

Baker discloses employs, after establishing the frame alignment **(fig 1, where the mixing of the received signal with the NCO is equivalent to frame synchronization, and this mixing is the first process done in the coherent detection, thus the completion of coherent detection is achieved after this process of synchronization)** using said sync word portion **(Col 2 lines 30-35, where the sync word is used for frame synchronization),** said sync word portion **(Col 2**

lines 30-35, where the sync word is used for frame synchronization) for the coherent detection **(see fig 1 for coherent detection)**.

It would have been obvious to one of the ordinary skill in the art at the time of the invention was disclosed to modify the coherent detector disclosed by the combined teachings of Barroso and Mat, as taught by Baker, since stated in Col 1 lines 30-35 of Baker, that such a modification will fulfill the need for a coherent detector that can determine the initial constellation point rapidly and track the rotating constellation.

Regarding claim 24, Barroso discloses wherein said known pilot symbols of each slot comprise multiple known pilot symbol portions and multiple sync word portion aligned consecutively and wherein said pilot symbol portion and said sync word portion are transmitted alternately in each slot **(Table 1 shows multiple alternating pilots and syncs)**.

Regarding claim 25, Barroso discloses receiving a block **(Column 1 lines 51-56)** consisting of a plurality of known pilot symbols, which has been transmitted at every slot, a predetermined number of said slots forming a frame **(Table 1 and Column 2 lines 24-63, pilot symbol pattern including predetermined slots and symbols)**; and

wherein said block consisting of said pilot symbols consists of a known pilot symbol portion and a sync word portion for flame alignment **(Table 1 and Column 2 lines 24-63, notice SW's used for frame alignment and notice pilot symbol pattern),** the known pilot symbol portion and the sync word portion in each slot being aligned consecutively **(Table 1 shows consecutive alignment)**

Barroso does not specifically disclose means for carrying out coherent detection using the received blocks and wherein said means for carrying out coherent detection carries out the coherent detection using said known pilot symbol portion.

Mat discloses means for carrying out coherent detection **(Col 7 lines 3-6 shows coherent detectors)** by using the received blocks **(Col 7 lines 3-11, coherent detectors using known symbols, such as the unique word and pilot symbols)**

wherein said means for carrying out coherent detection **(Col 7 lines 3-6 shows coherent detectors)** carries out the coherent detection using said known pilot symbol portion **(Col 7 lines 3-11, coherent detectors using known symbols, such as the unique word and pilot symbols)**.

It would have been obvious to one of the ordinary skill in the art at the time of the invention was disclosed to modify the process of receiving of Barroso, as taught by Mat, since stated in Col 7 lines 8-19 of Mat, that such a modification will provide a signal detection using coherent detection and employing a fading estimation scheme that takes into account the generation process of the fading frequency selectivity and exploit the benefit of the offset pilot location thus overcoming the disadvantages of prior art as it pertains to frequency selective fading.

Although Mat discloses carrying out coherent detection using sync symbols **(Col 7 lines 3-11, coherent detectors using known symbols, such as the unique word and pilot symbols),** the combined teachings of Barroso and Mat do not explicitly teach

employs, after establishing the frame alignment using said sync word portion, said sync word portion for the coherent.

Baker discloses employs, after establishing the frame alignment **(fig 1, where the mixing of the received signal with the NCO is equivalent to frame synchronization, and this mixing is the first process done in the coherent detection, thus the completion of coherent detection is achieved after this process of synchronization)** using said sync word portion **(Col 2 lines 30-35, where the sync word is used for frame synchronization)**, said sync word portion **(Col 2 lines 30-35, where the sync word is used for frame synchronization)** for the coherent detection **(see fig 1 for coherent detection)**.

It would have been obvious to one of the ordinary skill in the art at the time of the invention was disclosed to modify the coherent detector disclosed by the combined teachings of Barroso and Mat, as taught by Baker, since stated in Col 1 lines 30-35 of Baker, that such a modification will fulfill the need for a coherent detector that can determine the initial constellation point rapidly and track the rotating constellation.

Regarding claim 26, Barroso discloses wherein said known pilot symbols of each slot comprise multiple known pilot symbol portions and multiple sync word portion aligned consecutively and wherein said pilot symbol portion and said sync word portion transmitted alternately in each slot **(Table 1 shows multiple alternating pilots and syncs)**.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER P. GREY whose telephone number is (571)272-3160. The examiner can normally be reached on 10AM-7:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Moe Aung can be reached on (571)272-7314. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Christopher P Grey/
Examiner, Art Unit 2474